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			2862	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/650,263	BAUDENBACHER ET AL. 	
	Examiner	Art Unit	
	Kenneth J Whittington	2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 34-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☒ Claim(s) 32 and 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2862

DETAILED ACTION

The Amendment filed March 10, 2005 and the Information Disclosure Statement filed April 18, 2005 have been entered and reviewed. In view thereof, the objections to the specification
5 and the drawings have been withdrawn in part.

Election/Restrictions

Newly submitted claims 34-39 are directed to an invention that is independent or distinct from the invention originally
10 claimed for the following reasons:

- I. Claims 1-33, drawn to a SQUID apparatus having a radiation shield with an extension and eddy current prevention means, classified in class 324, subclass 248.
- 15 II. Claims 34-39, drawn to a SQUID apparatus having two temperature zones, also classified in class 324, subclass 248.

The inventions are distinct, each from the other because of the following reasons:

20 Inventions in Group I and Group II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case,

Art Unit: 2862

invention in Group I has separate utility such as a method for preserving the temperature of the cold finger and detecting coil and prevention of eddy currents in the plane of the coil, whereas the invention in Group II requires two separate
5 temperature zones. Accordingly, the inventions in either group do not require the particulars of the other group. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of
10 their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution
15 on the merits. Accordingly, claims 34-39 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in
20 compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must

Art Unit: 2862

be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

During a telephone conversation with Bernard Kleinke (Reg. No. 22,123) on April 21, 2005, a provisional election was made without traverse to prosecute the invention of Group I, claims 1-33. Applicant further agreed to cancel of the claims in Group II in favor of filing a divisional application.

Prior Art References

10 In response the Requirement for information contained in the Office Action mailed December 8, 2004, Applicants are thanked for submitting the references. However, it is noted that those references listed in paragraphs 0029 and 0041 have not been submitted. Therefor the requirement for information
15 remains as to those references. If those references are unavailable or Applicants are unable to submit them, then the references to those articles in the specification are required to be deleted.

Specification

20 The disclosure is objected to because of the following informalities: paragraphs 0018, 0033, 0037 and 0045 cite articles that have been cited in other paragraphs of this

Art Unit: 2862

portion of the specification, note paragraphs 0005, 0023, 0030 and 0036. Appropriate correction is required.

Claim Rejections - 35 USC § 103

5 The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

 Claims 1-7, 22, 23, 25, 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over the internet article titled Supplementary Images for Science Report, A Low Temperature

10 Transfer of ALH84001 from Mars to Earth, hereinafter Science Report, in view of the paper titled Advances in Cryogenic Engineering, hereinafter Advances, and Saho et al. (US 6,563,312). Regarding claim 1, Science Report teaches an apparatus for high resolution imaging of a sample, comprising a

15 SQUID evacuated dewar; a SQUID sensor cooperating with the dewar to sense magnetic flux from the sample being imaged, said sensor having a detection magnetometer coil; a cold finger, said dewar having a thin window; means for mounting the sensor remotely from the window, the detection coil being electrically connected

20 to the SQUID, a mechanism for mounting the detection coil in close proximity to the thin window; and a radiation shield mounted within the dewar and having an extension surrounding near the detection coil to help maintain its cold temperature

Art Unit: 2862

(See Science Report page 2 of 8, figures shown and descriptions thereof).

However, it is unclear whether the extension surrounds the detection coil in the manner as recited in the claims. Advances teaches a radiation shield surrounding the pick up coil in a SQUID (See Advances FIG. 6, page 112). It would have been obvious at the time the invention was made to modify the apparatus disclosed in Science Report as taught in Advances. One having ordinary skill in the art would have been motivated to do so minimize radiative heat input to the coil system (See Advances page 112, 1st full paragraph).

This combination also does not explicitly teach the radiation shield preventing eddy currents in the plane adjacent the detection coil. Saho et al. teaches strips of material on the radiation shield adjacent the detection coils of the SQUID apparatus (See FIGS. 1-6, Squids 2, radiation shield 5 note strips of material converging near the detection coil section of the SQUID). It would have been obvious at the time the invention was made to incorporate the longitudinal pieces of material in the radiation shield of the noted combination. One having ordinary skill in the art would have been motivated to do so to prevent eddy currents to be produced in the vicinity of

Art Unit: 2862

the detection coils allowing for measurement of minimal magnetic fields (See Saho et al. col. 2, lines 8-67).

Regarding claims 2, 3, 5 and 6, the Science Report teaches a thick backing window overlaying the thin window and including
5 a hole therein for receiving the detection coil and a distal end of the shield extension, both the thin and thick windows being of a sapphire material (See Science Report FIG. 4, page 2 of 8).

Regarding claim 4, the combination teaches the shield extension being conical and the window hole tapered (See Science
10 Report FIG. 4, page 2 of 8 and see Advances FIG. 6, page 112).

Regarding claim 7, the Science Report teaches a positioning mechanism for moving the detection coil toward and away from the thin window (See Science Report FIG. 3, page 2 of 8).

Regarding claim 22, the combination teaches the extension
15 comprising at least one longitudinally extending slot (See Saho et al. FIGS. 2-10).

Regarding claim 23, the combination teaches the extension having a conical shape, the upper portion being larger (See the Science Report FIG. 4, page 2 of 8 and see Advances FIG. 6, page
20 112).

Regarding claim 25, the combination teaches the extension being made of coil foil (See Saho et al. col. 4, lines 1-67).

Art Unit: 2862

Regarding claims 27-29 and 31, the Science Report teaches the apparatus including a cold finger reservoir containing helium disposed below a radiation shield reservoir containing nitrogen (See Science Report FIGS. 2-4, page 2 of 8).

5 Regarding claim 30, the radiation shield surrounds both reservoirs (See Science Report FIGS. 2-4, page 2 of 8).

Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Science Report in view of Advances and Saho et al. as applied to claims 1 and 7 above, and further
10 in view of Wellstood et al. (US 5,491,411), hereinafter Wellstood. Regarding claim 8, the noted combination teaches each and every limitation of claims 1 and 7 as noted above. However, this combination does not explicitly disclose a lever
15 in the apparatus. Wellstood teaches of a lever used in the positioning apparatus of a SQUID apparatus (See Wellstood FIGS. 4A-4C). It would have been obvious to use the lever assembly of Wellstood in the apparatus of the combination. One having ordinary skill in the art would have been motivated to do so to
20 allow for fine adjustment between the samples and the sensor (See Wellstood col. 9, line 56 to col. 10, line 7).

Regarding claim 10, the noted combination teaches each and every limitation of claim 1 as noted above. However, this

Art Unit: 2862

combination does not explicitly disclose the particular coil arrangement. Wellstood teaches of a bare SQUID magnetometer (See Wellstood III FIGS. 2A and 2B and col. 2, lines 52-65). It would have been obvious to use the bare SQUID of Wellstood in the apparatus of the noted combination. One having ordinary skill in the art would have been motivated to do so to allow for the SQUID apparatus to resolve very small features (See Wellstood III col. 2, lines 52-65).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Science Report in view of Advances, Saho et al. and Wellstood as applied to claims 1, 7 and 8 above, and further in view of Sapir (US 2004/0007004). The noted combination teaches each and every limitation of claims 1, 7 and 8 as noted above. However, this combination does not explicitly disclose the use of a flexure bearing. Sapir teaches of a flexure bearing used in the positioning apparatus of a shaft in a cryogenic apparatus (See Sapir FIG. 2, note flexure bearing 25 and shaft 30). It would have been obvious to use the flexure bearing of Sapir in the apparatus of the noted combination. One having ordinary skill in the art would have been motivated to do to provide precision alignment of the SQUID sensor of the along its desired longitudinal axis while maintaining radial rigidity

Art Unit: 2862

with respect to undesired motion (See Sapir, page 3, paragraph 0031).

Claims 11, 13, 14, and 18 are rejected under 35

5 U.S.C. 103(a) as being unpatentable over the Science Report in view of Advances and Saho et al. as applied to claim 1 above, and further in view of Marooka et al. (US 5,825,183). Regarding these claims, the noted combination teaches each and every limitation of claims 1 as noted above. However, this
10 combination does not explicitly disclose the particulars of the coil arrangement used in the apparatus. Marooka et al. teaches of a thin film detection coil that is an asymmetrical and first differential coil for use in a SQUID apparatus (See Marooka et al. FIG. 12). It would have been obvious to use the coil design
15 as taught by Marooka in the apparatus of the noted combination. One having ordinary skill in the art would have been motivated to do so to provide a SQUID magnetic flux meter that has good special resolution, coil balance and is suitable for mass production (See Marooka et al. col., 2, lines 17-19) and to
20 eliminate ambient and background in the sensor (See Marooka et al. col. 1, lines 48-50).

Regarding claim 18, the noted combination teaches each and every limitation of claim 1 as noted above. However, as

Art Unit: 2862

mentioned before, this combination does not explicitly disclose the particulars of the coil arrangement. Marooka et al. also teaches of a fractional turn coil for a SQUID apparatus (See Marooka et al. FIG. 2). It would have been obvious to use the fractional turn coil in the apparatus of the noted combination. One having ordinary skill in the art would have been motivated to do so to reduce the self-inductance that accompanies full circumferential coils (See Marooka et al. col. 4, lines 14-32).

Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the noted combination as applied to claim 1 above, and further in view of Wikswo, Jr. et al. (US 5,038,104). Regarding these claims, the noted combination teaches each and every limitation of claim 1 as noted above.

However, this combination does not explicitly disclose the particulars of the coil arrangement used in the apparatus. Wikswo Jr. et al. teaches of an apodized gradiometer coil design for a SQUID apparatus (See Wikswo Jr. et al. FIGS. 2D-F). It would have been obvious to use an apodized coil in the apparatus of the noted combination. One having ordinary skill in the art would have been motivated to do so to provide a coil arrangement for a SQUID apparatus which generates improved current density images while using a magnetometer pickup coil with an improved

Art Unit: 2862

signal-to-noise ratio, the coil having a reduced size with the number turns increased without a large increase in coil inductance (See Wikswo, Jr. et al. col. 2, lines 18-48).

5 Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over the noted combination as applied to claim 1 above, and further in view of Tsukada et al. (US 6,424,853). Regarding claim 16, the noted combination teaches each and every limitation of claim 1 as noted above. However, this combination
10 does not explicitly disclose the particulars of the coil arrangement used in the apparatus. Tsukada et al. teaches of a vector magnetometer for a SQUID apparatus (See Tsukada et al. FIG. 2). It would have been obvious to use a vector magnetometer in the apparatus of Wellstood I in view of
15 Wellstood II. One having ordinary skill in the art would have been motivated to do so to measure the magnetic fields in three directions to create a three dimensional view of the object to be measured even when the object has moved (See Tsukada et al. col. 2, lines 39-65).

20

Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Wellstood et al. (US 5,894,220), hereinafter Wellstood II, in view of Advances. Regarding claims

Art Unit: 2862

19, Wellstood II teaches a method for microscopic imaging of a sample comprising:

sensing magnetic flux from the sample using a SQUID evacuated dewar and a SQUID sensor having a detection coil and mounting the detection coil in close proximity to a thin window forming a part of the dewar (See Wellstood I FIGS. 1a, 2, 3a, 3b and 4a-c, using dewar item 15 and SQUID chip 72 with sensor 70 being a negative feedback loop or flux-locked loop and note electronics in FIG. 6).

10 However, Wellstood II does not explicitly teach of mounting a radiation shield. Advances teaches mounting a radiation shield having an extension surrounding the pick up coil in a SQUID (See Advances FIG. 6, page 112). It would have been obvious at the time the invention was made to modify the apparatus disclosed in Wellstood II as taught in Advances. One having ordinary skill in the art would have been motivated to do so minimize radiative heat input to the coil system (See Advances page 112, 1st full paragraph).

20 Regarding claim 20, Wellstood I teaches of replacing the SQUID sensor with other types of cryogenic sensors or multiple SQUID sensors, each having a detection coil (See Wellstood I col. 12, lines 20-25).

Art Unit: 2862

Regarding claim 21, Wellstood I teaches applying a magnetic field to the sample being imaged prior to or during said sensing (See Wellstood I col. 6, lines 30-34).

5 Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over the noted combination as applied to claim 1 above, and further in view of Van Kann et al. (US 5,668,315). Regarding this claim, the noted combination teaches each and every limitation of claim 1 as noted above. However, this
10 combination does not explicitly disclose the shield comprising aluminum. Van Kann et al. teaches using layers of aluminum-mylar surrounding a radiation shield (See Van Kann et al. col. 5, lines 10-25). It would have been obvious at the time the invention was made to make the shield as taught by Van Kann et
15 al. One having ordinary skill in the art would have been motivated to do so because such methods for shielding dewars are well known combinations and/or structures for thermally insulating a dewar, especially in SQUID apparatus as taught by Van Kann et al.

20

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over the noted combination as applied to claim 1 above, and further in view of Zeamer (US 4,613,816). Regarding

Art Unit: 2862

this claim, the noted combination teaches each and every limitation of claim 1 as noted above. Furthermore, Saho et al. teaches using a plastic as a base for the radiation shield, but only provides one example of such plastic. However, Zeamer
5 teaches that it is known to use a G-10 composite material for dewars (See Zeamer col. 3, lines 8-27). It would have been obvious at the time the invention was made to use the G-10 composite for the plastic material of the combination. One having ordinary skill in the art would have been motivated to do
10 so to provide a structural material capable of maintaining the dewar at cryogenic temperatures and has a very low coefficient of expansion or contraction (See same paragraphs of Zeamer).

Allowable Subject Matter

15 Claims 32 and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication
20 of allowable subject matter: the prior art does not disclose a material disposed on the bobbin tip for cooling the pickup coil below the transition temperature.

Art Unit: 2862

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new and amended grounds of rejection that were necessitated by the amendments of the
5 claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS**
10 **ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this
15 action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any
20 extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

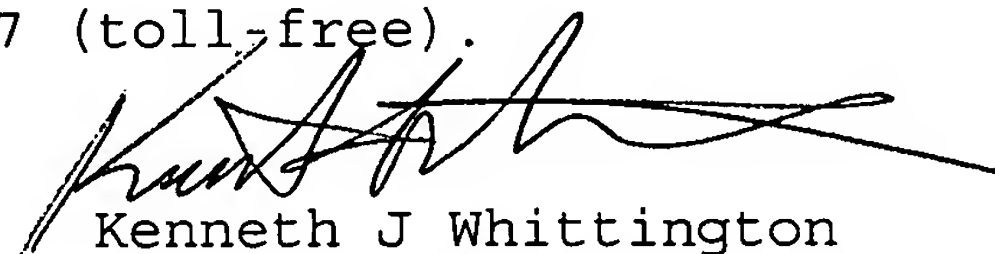
Art Unit: 2862

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J Whittington whose telephone number is (571) 272-2264. The examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


JAY PATIDAR
PRIMARY EXAMINER


Kenneth J Whittington
Examiner
Art Unit 2862

kjw